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Application No. 03 782 583.3 - 2115	Ref. PBA/P005082PEP	Date 04.01.2006
Applicant The University of Manchester		

Communication pursuant to Article 96(2) EPC

The examination of the above-identified application has revealed that it does not meet the requirements of the European Patent Convention for the reasons enclosed herewith. If the deficiencies indicated are not rectified the application may be refused pursuant to Article 97(1) EPC.

You are invited to file your observations and insofar as the deficiencies are such as to be rectifiable, to correct the indicated deficiencies within a period

of 4 months

from the notification of this communication, this period being computed in accordance with Rules 78(2) and 83(2) and (4) EPC.

One set of amendments to the description, claims and drawings is to be filed within the said period on separate sheets (Rule 36(1) EPC).

Failure to comply with this invitation in due time will result in the application being deemed to be withdrawn (Article 98(3) EPC).



Kiebooms, R
Primary Examiner
for the Examining Division

Enclosure(s): 4 page/s reasons (Form 2906)

Registered Letter
EPO Form 2001 07.02CSX

**Beschreibung/Protokoll (Anlage)**Datum
Date 04.01.2006**Communication/Minutes (Annex)**Blatt
Sheet 1
Folie**Notification/Procès-verbal (Annexe)**Anmelde-Nr.:
Application No.: 03 782 583.3
Demande n°:

The examination is being carried out on the following application documents:

Description, Pages

1-22 as published

Claims, Numbers

1-38 as published

1. Reference is made to the following documents; the numbering will be adhered to in the rest of the procedure:

D1: B. BOINON, B. BENAYAD, J.P. MONTHÉARD: "Poly[(chloro-2-éthyl)-4-phényl]-1-éthylène): Synthèse, caractérisations, dégradation thermique et modifications chimiques" MAKROMOL. CHEM., vol. 190, 1989, pages 241-253, XP002276360

D2: J. ZHU, M.A. MCKINNEY, C.A. WILKIE: "Stabilization of polystyrene by Friedel-Crafts chemistry: effect of position of alcohol and the catalyst" POLYMER DEGRADATION AND STABILITY, vol. 66, 1999, pages 213-220, XP002276361

D3: D.A. JAEGER, C.T. FINLEY, M.R. WALTER, C.A. MARTIN: "Preparation and characterization of base-sensitive destructible surfactants" J.ORG.CHEM., vol. 51, 1986, pages 3956-3959, XP002276362

D4: DE 842 198 C (HOECHST AG) 23 June 1952 (1952-06-23)

2. The Applicant should remedy the following deficiencies in order to avoid an objection under Article 84 EPC:

- 2.1 The subject-matter of claim 2 and claim 3 appears to be the same. The Applicant should delete one of both claims.



Bescheid/Protokoll (Anlage)

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Anmelde-Nr.:

Application No.: 03 782 583.3

Demande n°:

- 2.2 In claim 21 the expression "*directly or indirectly dependent from claim 3*" seems to referring to the wrong claim.
Moreover, the applicant should clarify what is meant by "*directly or indirectly dependent*"? This expression is superfluous and should be deleted.
- 2.3 In claim 29 and claim 30 it appears that in stead of referring to claim 1, the claims 29 and 30 should refer to claim 5.
- 2.4 The Applicant should be consistent in his use of terminology throughout the claims. Hence, the expression "emulsion" in claim 35 should be replaced by "latex".
- 2.5 There seems to be a reference to the wrong claims (claims 3 and claim 7) in claims 21 and 38
- 2.6 The Applicant should cite relevant prior art if he is aware of any.
- 2.7 The applicant writes in the description (pages 11-12) that "purity has been proven by NMR". NMR is not a commonly accepted method for determining purity. Accepted methods for determining purity are Elemental Analysis or High Resolution Mass Spectroscopy. Because of the reactivity of the compound of claim 37 it can be questioned whether the compound of claim 37 has really been obtained until conclusive spectroscopic data can be provided.
If it cannot be proven that the compound of claim 37 has been obtained, an objection under article 83 EPC may arise because the invention than appears not to be sufficiently disclosed for it to be carried out by the skilled person.
3. Insofar as the above objections can be met, the subject-matter of claims 1-38 is new in the sense of Article 33(2) PCT, because none of the cited prior art describes the method of effecting crosslinking based on generating vinyl sulfonyl moieties *in situ* with the resin.



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Application No.: 03 782 583.3
Demande n°:

4. Insofar as the above objections can be met, the subject-matter of claims 1-38 involves an inventive step in the sense of Article 83(3) PCT.

D2 has been selected as most relevant prior art because it relates to crosslinking of polystyrene effected by means of hydroxy containing side groups.

The difference between the Application and D² is that in the Application the hydroxy containing side group contains a sulfonyl functionality and that the crosslinking is based on the *in situ* creation of vinyl sulfonyl moieties.

The problem to be solved is that of providing in improved storage stable cross-linkable resin compositions.

The technical solution for this problem resides in the nature of the cross-linking reaction. In D2 crosslinking reactions in polystyrene are effected by preparing copolymers from monomers containing hydroxy substituents or side groups. One of such monomers is for example 4-(2-hydroxyethyl)styrene.

The solution proposed by the present application however is based on the preparation of copolymers comprising 4-(2-hydroxyethylsulfonyl)styrene. This approach as well as the preparation of the monomer are not disclosed in the cited prior art D1-D4.

In addition, the reactivity of 2-hydroxyethylsulfonyl substituent would not lead such compounds to be the obvious choice of the skilled person. Hence, the presence of an inventive step can be acknowledged.

4. It is not at present apparent which part of the application could serve as a basis for a new claim. Should the applicant nevertheless regard some particular subject-matter as being patentable, an independent claim should be filed taking account of Rule 29(1) EPC.
- 4.1 For the examination of **novelty** of any new claim the applicant should also indicate in the letter of reply the difference of the subject-matter of the new claim vis-à-vis the state of the art.
- 4.2 In order to be able to assess the presence of an **inventive step** of the new claims, the applicant is explicitly requested to



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Anmelde-Nr.:

Application No.: 03 782 583.3

Demande n°:

- (1) indicate which cited document should in his opinion be considered as the most relevant prior art.
- (2) Indicate the difference between the application and this most relevant prior art in terms of technical features.
- (3) demonstrate what technical effect is caused by this difference.
- (4) on the basis of this technical effect, provide a formulation of the objective technical problem to be solved underlying the claimed invention.
- (5) Indicate why the subject-matter of the new claims should be considered to be a non-obvious solution to said problem.
- (6) substantiate any surprising technical effect by comparison with the cited prior art.

5. The attention of the Applicant is drawn to the fact that the application may not be amended in such a way that it contains subject-matter which extends beyond the content of the application as filed, Article 123(2) EPC.

In order to facilitate the examination of the conformity of the amended application with the requirements of Article 123(2) EPC, the Applicant is requested:

- (1) clearly identify all amendments carried out, preferably in handwritten form into the original text,
- (2) indicate for all amendments the passages of the application as filed on which these amendments are based (Guidelines E-II, 1).